

Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



Scaled data based on original data using  
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions

Brand: NEO-RAY

Report Number: P923272

Luminaire Tested: DFN2DIP-SQ4F0-120D120US940-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P923272  
REPORT IS A COMBINATION OF REPORTS P900179 AND P896915  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-120D120US940-FLLFLL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

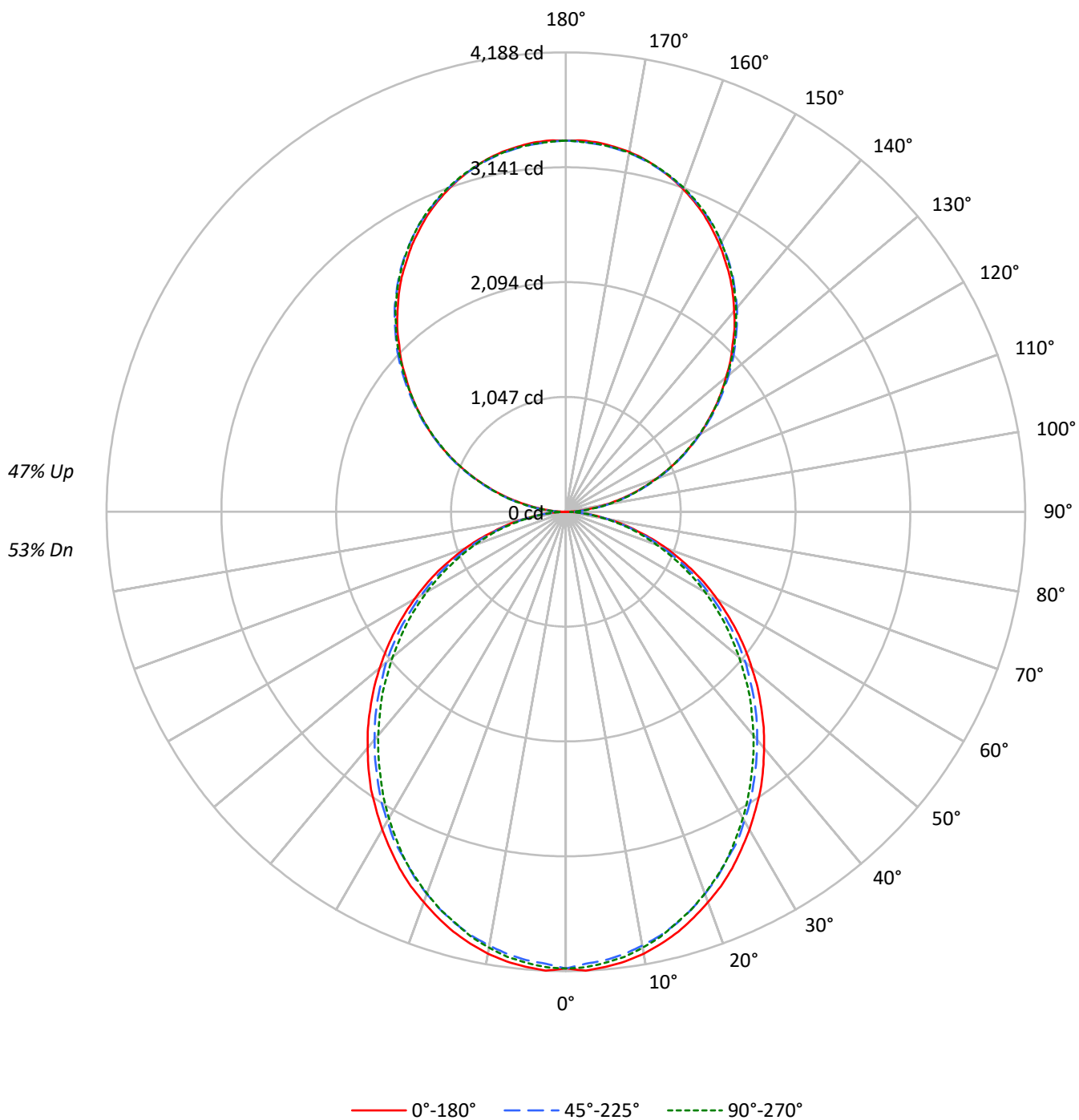
Lumens per Lamp: N/A  
Luminaire Lumens: 20063.5 lumens  
Efficiency: N/A  
Efficacy: 96.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 207.7  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9933  
Total Harmonic Distortion (THDi): 0.066  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P923272

CATALOG NUMBER: DFN2DIP-SQ4F0-120D120US940-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P923272

CATALOG NUMBER: DFN2DIP-SQ4F0-120D120US940-FLLFLL

**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

|     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|
| RF  | 20  |     |     |     | 20  |     |     |     | 20 |    |    |    | 20 |    |    |    | 20 |
| RC  | 80  |     |     |     | 70  |     |     |     | 50 |    |    |    | 30 |    |    |    | 10 |
| RW  | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 |
| RCR |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |
| 0   | 108 | 108 | 108 | 108 | 100 | 100 | 100 | 100 | 85 | 85 | 85 | 71 | 71 | 71 | 59 | 59 | 59 |
| 1   | 98  | 94  | 90  | 87  | 91  | 87  | 84  | 81  | 74 | 72 | 70 | 63 | 61 | 59 | 52 | 51 | 50 |
| 2   | 90  | 82  | 76  | 71  | 83  | 76  | 71  | 66  | 65 | 61 | 58 | 55 | 52 | 50 | 46 | 44 | 42 |
| 3   | 82  | 72  | 65  | 59  | 75  | 67  | 61  | 55  | 58 | 53 | 49 | 49 | 45 | 42 | 41 | 38 | 36 |
| 4   | 75  | 64  | 56  | 50  | 69  | 60  | 52  | 47  | 51 | 46 | 41 | 43 | 39 | 36 | 36 | 33 | 31 |
| 5   | 69  | 57  | 49  | 43  | 63  | 53  | 46  | 40  | 46 | 40 | 36 | 39 | 35 | 31 | 33 | 29 | 27 |
| 6   | 63  | 51  | 43  | 37  | 58  | 48  | 40  | 35  | 41 | 36 | 31 | 35 | 31 | 27 | 30 | 26 | 24 |
| 7   | 59  | 46  | 38  | 33  | 54  | 43  | 36  | 31  | 37 | 32 | 28 | 32 | 28 | 24 | 27 | 24 | 21 |
| 8   | 54  | 42  | 34  | 29  | 50  | 39  | 32  | 27  | 34 | 29 | 24 | 29 | 25 | 22 | 25 | 21 | 19 |
| 9   | 51  | 38  | 31  | 26  | 47  | 36  | 29  | 24  | 31 | 26 | 22 | 27 | 23 | 19 | 23 | 20 | 17 |
| 10  | 47  | 35  | 28  | 23  | 44  | 33  | 26  | 22  | 29 | 23 | 20 | 25 | 21 | 18 | 21 | 18 | 15 |

**AVERAGE LUMINANCE (cd/sqm):**

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2922 | 2922 | 2922 |
| 5°  | 2926 | 2881 | 2901 |
| 10° | 2902 | 2843 | 2863 |
| 15° | 2860 | 2797 | 2802 |
| 20° | 2802 | 2733 | 2740 |
| 25° | 2745 | 2655 | 2668 |
| 30° | 2673 | 2583 | 2577 |
| 35° | 2604 | 2499 | 2480 |
| 40° | 2521 | 2413 | 2388 |
| 45° | 2437 | 2327 | 2294 |
| 50° | 2345 | 2237 | 2184 |
| 55° | 2250 | 2133 | 2084 |
| 60° | 2141 | 2010 | 1969 |
| 65° | 2023 | 1882 | 1834 |
| 70° | 1873 | 1726 | 1689 |
| 75° | 1664 | 1539 | 1556 |
| 80° | 1414 | 1302 | 1300 |
| 85° | 1022 | 891  | 874  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2663 cd/sqm

TEST NUMBER: P923272

CATALOG NUMBER: DFN2DIP-SQ4F0-120D120US940-FLLFLL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 391.9   | 2.0       |
| 10°-20°   | 1102.6  | 5.5       |
| 20°-30°   | 1620.4  | 8.1       |
| 30°-40°   | 1882.0  | 9.4       |
| 40°-50°   | 1879.7  | 9.4       |
| 50°-60°   | 1639.0  | 8.2       |
| 60°-70°   | 1211.6  | 6.0       |
| 70°-80°   | 685.5   | 3.4       |
| 80°-90°   | 190.5   | 0.9       |
| 90°-100°  | 209.4   | 1.0       |
| 100°-110° | 665.4   | 3.3       |
| 110°-120° | 1138.7  | 5.7       |
| 120°-130° | 1497.5  | 7.5       |
| 130°-140° | 1680.9  | 8.4       |
| 140°-150° | 1648.3  | 8.2       |
| 150°-160° | 1382.7  | 6.9       |
| 160°-170° | 917.0   | 4.6       |
| 170°-180° | 320.5   | 1.6       |
| 0°-30°    | 3114.9  | 15.5      |
| 0°-40°    | 4996.9  | 24.9      |
| 0°-60°    | 8515.5  | 42.4      |
| 0°-90°    | 10603.1 | 52.8      |
| 90°-120°  | 2013.4  | 10.0      |
| 90°-150°  | 6840.1  | 34.1      |
| 90°-180°  | 9460.0  | 47.2      |
| 0°-180°   | 20063.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4164 | 4164  | 4164 | 4164  | 4164 |      |
| 5°   | 4164 | 4148  | 4104 | 4136  | 4128 | 395  |
| 15°  | 3964 | 3940  | 3888 | 3904  | 3884 | 1116 |
| 25°  | 3587 | 3555  | 3487 | 3495  | 3487 | 1651 |
| 35°  | 3095 | 3055  | 2991 | 2967  | 2947 | 1933 |
| 45°  | 2518 | 2490  | 2430 | 2386  | 2370 | 1944 |
| 55°  | 1906 | 1882  | 1834 | 1786  | 1766 | 1704 |
| 65°  | 1285 | 1261  | 1221 | 1185  | 1165 | 1271 |
| 75°  | 672  | 665   | 644  | 621   | 629  | 718  |
| 85°  | 164  | 160   | 156  | 144   | 140  | 183  |
| 90°  | 3    | 37    | 100  | 94    | 97   | 19   |
| 95°  | 149  | 178   | 183  | 183   | 178  | 166  |
| 105° | 614  | 622   | 628  | 634   | 634  | 648  |
| 115° | 1143 | 1159  | 1154 | 1151  | 1143 | 1130 |
| 125° | 1662 | 1688  | 1679 | 1670  | 1667 | 1485 |
| 135° | 2150 | 2181  | 2188 | 2184  | 2176 | 1662 |
| 145° | 2610 | 2630  | 2646 | 2650  | 2638 | 1631 |
| 155° | 2984 | 2992  | 3002 | 3016  | 3007 | 1374 |
| 165° | 3246 | 3243  | 3243 | 3264  | 3250 | 916  |
| 175° | 3378 | 3370  | 3364 | 3384  | 3367 | 321  |
| 180° | 3384 | 3384  | 3384 | 3384  | 3384 |      |

TEST NUMBER: P923272

CATALOG NUMBER: DFN2DIP-SQ4F0-120D120US940-FLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4163.7 | 4163.7 | 4163.7 | 4163.7 | 4163.7 |
| 2.5°   | 4187.8 | 4167.9 | 4123.7 | 4163.7 | 4156.0 |
| 5°     | 4163.7 | 4147.9 | 4103.7 | 4135.6 | 4127.9 |
| 7.5°   | 4135.6 | 4111.8 | 4067.6 | 4099.9 | 4091.9 |
| 10°    | 4091.9 | 4063.8 | 4015.8 | 4047.7 | 4035.8 |
| 12.5°  | 4031.5 | 4007.7 | 3959.7 | 3979.7 | 3971.6 |
| 15°    | 3963.6 | 3939.8 | 3887.5 | 3903.6 | 3883.7 |
| 17.5°  | 3879.5 | 3855.7 | 3803.4 | 3823.4 | 3803.4 |
| 20°    | 3787.3 | 3763.5 | 3707.5 | 3719.3 | 3703.6 |
| 22.5°  | 3695.5 | 3659.4 | 3607.1 | 3607.1 | 3599.1 |
| 25°    | 3587.2 | 3555.3 | 3487.4 | 3495.1 | 3487.4 |
| 27.5°  | 3467.0 | 3439.0 | 3387.2 | 3375.2 | 3355.3 |
| 30°    | 3347.2 | 3314.9 | 3255.0 | 3243.2 | 3227.0 |
| 32.5°  | 3218.9 | 3195.2 | 3131.0 | 3106.8 | 3090.7 |
| 35°    | 3094.9 | 3055.0 | 2990.8 | 2966.6 | 2946.7 |
| 37.5°  | 2954.7 | 2918.7 | 2854.5 | 2826.5 | 2806.5 |
| 40°    | 2810.8 | 2778.5 | 2714.3 | 2678.6 | 2662.5 |
| 42.5°  | 2670.6 | 2638.3 | 2574.5 | 2534.2 | 2510.4 |
| 45°    | 2518.5 | 2490.5 | 2430.1 | 2386.4 | 2370.3 |
| 47.5°  | 2370.3 | 2342.2 | 2278.1 | 2233.9 | 2210.1 |
| 50°    | 2213.9 | 2194.0 | 2137.9 | 2081.8 | 2061.8 |
| 52.5°  | 2061.8 | 2033.8 | 1982.0 | 1937.8 | 1909.8 |
| 55°    | 1905.9 | 1881.8 | 1833.7 | 1785.7 | 1765.8 |
| 57.5°  | 1749.6 | 1729.7 | 1677.4 | 1629.4 | 1613.3 |
| 60°    | 1593.3 | 1577.6 | 1521.5 | 1477.4 | 1465.4 |
| 62.5°  | 1441.3 | 1413.2 | 1373.3 | 1333.4 | 1317.2 |
| 65°    | 1285.4 | 1261.1 | 1221.2 | 1185.1 | 1165.2 |
| 67.5°  | 1125.2 | 1104.8 | 1069.2 | 1041.2 | 1025.0 |
| 70°    | 977.0  | 960.8  | 924.7  | 896.7  | 881.0  |
| 72.5°  | 824.9  | 808.8  | 788.8  | 760.8  | 748.9  |
| 75°    | 672.4  | 664.8  | 644.3  | 620.6  | 628.7  |
| 77.5°  | 536.5  | 520.3  | 512.3  | 500.3  | 488.5  |
| 80°    | 400.6  | 396.3  | 388.3  | 376.4  | 368.3  |
| 82.5°  | 272.2  | 272.2  | 268.5  | 252.4  | 252.4  |
| 85°    | 164.0  | 160.2  | 156.3  | 144.0  | 140.2  |
| 87.5°  | 72.2   | 64.1   | 56.1   | 44.1   | 39.9   |
| 90°    | 3.0    | 36.7   | 100.0  | 93.9   | 96.9   |
| 92.5°  | 63.2   | 85.7   | 88.7   | 91.8   | 91.8   |
| 95°    | 148.9  | 177.5  | 182.6  | 182.6  | 177.5  |
| 97.5°  | 247.9  | 274.5  | 285.7  | 285.7  | 285.7  |
| 100°   | 362.2  | 385.7  | 393.8  | 393.8  | 390.7  |
| 102.5° | 482.6  | 499.9  | 511.1  | 514.2  | 511.1  |
| 105°   | 614.2  | 622.3  | 628.5  | 633.6  | 633.6  |
| 107.5° | 744.8  | 757.1  | 757.1  | 759.0  | 744.8  |
| 110°   | 871.3  | 887.6  | 887.6  | 887.6  | 879.5  |

TEST NUMBER: P923272

CATALOG NUMBER: DFN2DIP-SQ4F0-120D120US940-FLLFLL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1008.0 | 1025.4 | 1022.3 | 1014.1 | 1008.0 |
| 115°   | 1142.6 | 1159.0 | 1153.9 | 1150.8 | 1142.6 |
| 117.5° | 1276.3 | 1298.8 | 1284.5 | 1276.3 | 1268.2 |
| 120°   | 1411.0 | 1433.4 | 1411.0 | 1411.0 | 1401.9 |
| 122.5° | 1533.5 | 1562.0 | 1547.7 | 1539.5 | 1533.5 |
| 125°   | 1662.0 | 1687.5 | 1679.4 | 1670.2 | 1667.1 |
| 127.5° | 1787.5 | 1819.1 | 1807.9 | 1795.6 | 1787.5 |
| 130°   | 1904.8 | 1941.5 | 1936.4 | 1930.3 | 1919.0 |
| 132.5° | 2036.4 | 2065.0 | 2067.0 | 2052.7 | 2044.6 |
| 135°   | 2149.6 | 2181.3 | 2187.5 | 2184.3 | 2176.2 |
| 137.5° | 2276.2 | 2301.7 | 2306.8 | 2304.7 | 2292.5 |
| 140°   | 2387.4 | 2412.9 | 2427.1 | 2427.1 | 2415.9 |
| 142.5° | 2501.7 | 2527.2 | 2535.3 | 2538.3 | 2527.2 |
| 145°   | 2609.8 | 2630.2 | 2646.5 | 2649.6 | 2638.4 |
| 147.5° | 2706.7 | 2732.2 | 2744.5 | 2749.6 | 2738.4 |
| 150°   | 2806.7 | 2824.0 | 2835.3 | 2844.5 | 2835.3 |
| 152.5° | 2895.5 | 2912.8 | 2927.1 | 2938.4 | 2927.1 |
| 155°   | 2984.2 | 2992.4 | 3001.6 | 3015.9 | 3006.7 |
| 157.5° | 3060.8 | 3066.9 | 3071.9 | 3092.4 | 3078.1 |
| 160°   | 3129.1 | 3135.3 | 3138.3 | 3155.7 | 3143.4 |
| 162.5° | 3192.3 | 3192.3 | 3195.4 | 3214.8 | 3200.5 |
| 165°   | 3246.4 | 3243.4 | 3243.4 | 3263.7 | 3249.5 |
| 167.5° | 3295.4 | 3286.2 | 3286.2 | 3306.6 | 3292.4 |
| 170°   | 3332.1 | 3323.9 | 3320.9 | 3341.3 | 3323.9 |
| 172.5° | 3357.6 | 3349.4 | 3346.4 | 3366.8 | 3349.4 |
| 175°   | 3378.1 | 3369.9 | 3363.8 | 3384.1 | 3366.8 |
| 177.5° | 3389.3 | 3381.1 | 3374.9 | 3392.3 | 3374.9 |
| 180°   | 3384.1 | 3384.1 | 3384.1 | 3384.1 | 3384.1 |

TEST NUMBER: P923272

CATALOG NUMBER: DFN2DIP-SQ4F0-120D120US940-FLLFLL

**CIE UGR TABLE:**

| Reflectances:   |      |                  |       |       |       |       |                |       |       |       |       |
|-----------------|------|------------------|-------|-------|-------|-------|----------------|-------|-------|-------|-------|
| Ceiling         |      | 0.7              | 0.7   | 0.5   | 0.5   | 0.3   | 0.7            | 0.7   | 0.5   | 0.5   | 0.3   |
| Wall            |      | 0.5              | 0.3   | 0.5   | 0.3   | 0.3   | 0.5            | 0.3   | 0.5   | 0.3   | 0.3   |
| Reference plane |      | 0.2              | 0.2   | 0.2   | 0.2   | 0.2   | 0.2            | 0.2   | 0.2   | 0.2   | 0.2   |
| Room dimensions |      | Viewed crosswise |       |       |       |       | Viewed endwise |       |       |       |       |
| X=2H            | Y=2H | 11.27            | 12.16 | 12.20 | 13.11 | 14.33 | 10.82          | 11.71 | 11.76 | 12.66 | 13.89 |
|                 | 3H   | 12.93            | 13.73 | 13.88 | 14.69 | 15.94 | 12.44          | 13.24 | 13.39 | 14.20 | 15.45 |
|                 | 4H   | 13.53            | 14.28 | 14.48 | 15.24 | 16.50 | 13.03          | 13.79 | 13.99 | 14.75 | 16.01 |
|                 | 6H   | 13.93            | 14.63 | 14.90 | 15.59 | 16.87 | 13.43          | 14.12 | 14.40 | 15.09 | 16.37 |
|                 | 8H   | 14.04            | 14.70 | 15.01 | 15.69 | 16.96 | 13.54          | 14.20 | 14.51 | 15.18 | 16.46 |
|                 | 12H  | 14.09            | 14.72 | 15.07 | 15.70 | 17.00 | 13.58          | 14.21 | 14.56 | 15.19 | 16.49 |
| 4H              | 2H   | 11.73            | 12.49 | 12.70 | 13.45 | 14.71 | 11.38          | 12.13 | 12.34 | 13.09 | 14.36 |
|                 | 3H   | 13.61            | 14.23 | 14.58 | 15.23 | 16.50 | 13.20          | 13.83 | 14.17 | 14.82 | 16.10 |
|                 | 4H   | 14.32            | 14.90 | 15.31 | 15.89 | 17.19 | 13.90          | 14.48 | 14.88 | 15.46 | 16.76 |
|                 | 6H   | 14.84            | 15.34 | 15.84 | 16.35 | 17.65 | 14.41          | 14.91 | 15.41 | 15.92 | 17.22 |
|                 | 8H   | 15.00            | 15.46 | 15.99 | 16.46 | 17.78 | 14.56          | 15.02 | 15.56 | 16.03 | 17.34 |
|                 | 12H  | 15.07            | 15.49 | 16.09 | 16.51 | 17.83 | 14.62          | 15.04 | 15.64 | 16.06 | 17.38 |
| 8H              | 4H   | 14.52            | 14.99 | 15.52 | 15.99 | 17.30 | 14.15          | 14.61 | 15.14 | 15.61 | 16.93 |
|                 | 6H   | 15.16            | 15.54 | 16.18 | 16.59 | 17.90 | 14.78          | 15.16 | 15.80 | 16.21 | 17.52 |
|                 | 8H   | 15.38            | 15.72 | 16.41 | 16.75 | 18.08 | 14.99          | 15.33 | 16.02 | 16.36 | 17.69 |
|                 | 12H  | 15.52            | 15.82 | 16.55 | 16.84 | 18.22 | 15.11          | 15.41 | 16.14 | 16.43 | 17.81 |
| 12H             | 4H   | 14.51            | 14.93 | 15.53 | 15.95 | 17.27 | 14.14          | 14.56 | 15.16 | 15.58 | 16.90 |
|                 | 6H   | 15.19            | 15.53 | 16.22 | 16.56 | 17.89 | 14.82          | 15.16 | 15.85 | 16.19 | 17.52 |
|                 | 8H   | 15.44            | 15.73 | 16.47 | 16.76 | 18.13 | 15.06          | 15.35 | 16.09 | 16.38 | 17.75 |

END OF REPORT